CLAIMS

What is claimed is:

1.   A computerized method of updating a content description represented as a tree comprising:

    receiving a fragment update unit for the content description, the fragment update unit comprising a navigation path and an update command;

    selecting a set of nodes in the tree using the navigation path; and

    applying the update command to the set of nodes.

2.   The computerized method of claim 1, wherein the navigation path is a context-based address that selects the set of nodes based on their content.

3.   The computerized method of claim 2, wherein the content-based address is expressed as an XML XPath location path when the content description is coded in XML (extensible markup language).

4.   The computerized method of claim 1, wherein the fragment update unit comprises a fragment payload and applying the update command comprises updating the set of nodes in the tree with the fragment payload.

5.   The computerized method of claim 4, wherein the fragment update unit further comprises a plurality of fragment payloads and updating the set of nodes comprises

3   updating each one of the set of nodes with a different one of the plurality of fragment

4   payloads in a predetermined order.

1   6.   The computerized method of claim 5, wherein the predetermined order is

2   determined by an ordering of all nodes in the tree.

1   7.   The computerized method of claim 6, wherein the ordering of all nodes in the tree

2   is selected from the group consisting of pre-order, post-order and infix order.

1   8.   The computerized method of claim 4, wherein the fragment payload is selected

2   from the group consisting of a fragment, a fragment reference, and an attribute.

1   9.   The computerized method of claim 1, wherein the update command is selected

2   from the group consisting of add, delete, and replace commands.

1   10.   The computerized method of claim 1 further comprising:

2   sending the fragment update unit as part of an access unit.

1   11.   The computerized method of claim 1 further comprising:

2   selecting the update command;

3   formatting a fragment payload if required by the update command;

4   calculating the navigation path; and

5   creating the fragment update unit from the navigation path, the update command,

6   and the fragment payload if required.

1   12.   The computerized method of claim 11, wherein formatting a fragment payload

2   comprises including an attribute identification tag when an attribute is to be updated.

1   13.   The computerized method of claim 11, wherein the fragment payload is not

2   required when a fragment is to be deleted.

1   14.   A computerized method of updating a content description represented as a

2   description tree comprising:

3   selecting an update command to update a set of nodes in the description tree;

4   formatting a fragment payload if required by the update command;

5   calculating a navigation path that selects the set of nodes; and

6   creating the fragment update unit from the navigation path, the update command,

7   and the fragment payload if required.

1   15.   The computerized method of claim 14, wherein formatting a fragment payload

2   comprises including an attribute identification tag when an attribute is to be updated.

1   16.   The computerized method of claim 14, wherein the fragment payload is not

2   required when a fragment is to be deleted.

1   17.   The computerized method of claim 14, wherein the navigation path is a content-

2   based address.

1   18.   The computerized method of claim 17, wherein the content-based address is

2   expressed as an XML XPath location path when the content description is coded in XML

3   (extensible markup language).

1   19.   The computerized method of claim 14 further comprising formatting a plurality of

2   fragment payloads.

1   20.   The computerized method of claim 14, wherein the fragment payload is selected

2   from the group consisting of a fragment, a fragment reference, and an attribute.

1   21.   The computerized method of claim 14, wherein the update command is selected

2   from the group consisting of add, delete, and replace commands.

1   22.   The computerized method of claim 14 further comprising:

2   sending the fragment update unit as part of an access unit.

1   23.   A computer-readable medium having executable instructions to cause a computer

2   to execute a method comprising:

3   receiving a fragment update unit for a content description represented as a tree, the

4   fragment update unit comprising a navigation path and an update command;

5   selecting a set of nodes in the tree using the navigation path; and

6   applying the update command to the set of nodes.

1   24.   The computer-readable medium of claim 23, wherein the navigation path is a

2   context-based address that selects the set of nodes based on their content.

1   25.   The computer-readable medium of claim 24, wherein the content-based address is

2   expressed as an XML XPath location path when the content description is coded in XML

3   (extensible markup language).

1   26.   The computer-readable medium of claim 23, wherein the fragment update unit

2   comprises a fragment payload and applying the update command comprises updating the

3   set of nodes in the tree with the fragment payload.

1   27.   The computer-readable medium of claim 26, wherein the fragment update unit

2   further comprises a plurality of fragment payloads and updating the set of nodes

3   comprises updating each one of the set of nodes with a different one of the plurality of

4   fragment payloads in a predetermined order.

1   28.   The computer-readable medium of claim 27, wherein the predetermined order is

2   determined by an ordering of all nodes in the tree.

1   29.   The computer-readable medium of claim 28, wherein the ordering of all nodes in

2   the tree is selected from the group consisting of pre-order, post-order and infix order.

1   30.   The computer-readable medium of claim 26, wherein the fragment payload is

2   selected from the group consisting of a fragment, a fragment reference, and an attribute.

1 31. The computer-readable medium of claim 23, wherein the update command is

2 selected from the group consisting of add, delete, and replace commands.

1 32. The computer-readable medium of claim 23, wherein the method further

2 comprises:

3   sending the fragment update unit as part of an access unit.

1 33. The computer-readable medium of claim 23, wherein the method further

2 comprises:

3   selecting the update command;

4   formatting a fragment payload if required by the update command;

5   calculating the navigation path; and

6   creating the fragment update unit from the navigation path, the update command,

7 and the fragment payload if required.

1 34. The computer-readable medium of claim 33, wherein formatting a fragment

2 payload comprises including an attribute identification tag when an attribute is to be

3 updated.

1 35. The computer-readable medium of claim 33, wherein the fragment payload is not

2 required when a fragment is to be deleted.

1 36. A computer-readable medium having executable instructions to cause a computer

2 to execute a method comprising:

3   selecting an update command to update a set of nodes in a tree representing a

4   content description;

5   formatting a fragment payload if required by the update command;

6   calculating a navigation path that selects the set of nodes; and

7   creating the fragment update unit from the navigation path, the update command,

8   and the fragment payload if required.

1   37.   The computer-readable medium of claim 36, wherein formatting a fragment

2   payload comprises including an attribute identification tag when an attribute is to be

3   updated.

1   38.   The computer-readable medium of claim 36, wherein the fragment payload is not

2   required when a fragment is to be deleted.

1   39.   The computer-readable medium of claim 36, wherein the navigation path is a

2   content-based address.

1   40.   The computer-readable medium of claim 39, wherein the content-based address is

2   expressed as an XML XPath location path when the content description is coded in XML

3   (extensible markup language).

1   41.   The computer-readable medium of claim 36, wherein the method further

2   comprises formatting a plurality of fragment payloads.

1   42.   The computer-readable medium of claim 36, wherein the fragment payload is

2   selected from the group consisting of a fragment, a fragment reference, and an attribute.

1   43.   The computer-readable medium of claim 36, wherein the update command is

2   selected from the group consisting of add, delete, and replace commands.

1   44.   The computer-readable medium of claim 36, wherein the method further

2   comprises:

3   sending the fragment update unit as part of an access unit.

1   45.   A system comprising:

2   a processor coupled to a bus;

3   a memory coupled to the processor through the bus;

4   a communications interface coupled to the processor through the bus, and further

5   coupled to a communications medium; and

6   a decode process executed by the processor from the memory to cause the

7   processor to receive, through the communications interface, a fragment update unit for a

8   content description represented as a tree, wherein the fragment update unit comprises a

9   navigation path and an update command, to select a set of nodes in the tree using the

10   navigation path, and to apply the update command to the set of nodes.

1   46.   The system of claim 45, wherein the fragment update unit comprises a fragment

2   payload and the decode process further causes the processor to update the set of nodes in

3   the tree with the fragment payload when applying the update command.

1 47.   The system of claim 46, wherein the fragment update unit further comprises a

2 plurality of fragment payloads and the decode process further causes the processor to

3 update each one of the set of nodes with a different one of the plurality of fragment

4 payloads in a predetermined order to update the set of nodes.

1 48.   The system of claim 46, wherein the fragment payload is selected from the group

2 consisting of a fragment, a fragment reference, and an attribute.

1 49.   The system of claim 45, wherein the update command is selected from the group

2 consisting of add, delete, and replace commands.

1 50.   A system comprising:

2   a processor coupled to a bus;

3   a memory coupled to the processor through the bus; and

4   an encode process executed by the processor from the memory to cause the

5 processor to select an update command to update a set of nodes in a tree representing a

6 content description, to format a fragment payload if required by the update command, to

7 calculate a navigation path that selects the set of nodes, and to create the fragment update

8 unit from the navigation path, the update command, and the fragment payload if required.

1 51.   The system of claim 50, wherein the encode process further causes the processor

2 to include an attribute identification tag when an attribute is to be updated to format a

3 fragment payload.

1 52. The system of claim 50, wherein the fragment payload is not required when a

2 fragment is to be deleted.

1 53. The system of claim 50, wherein the encode process further causes the processor

2 to format a plurality of fragment payloads.

1 54. The system of claim 50, wherein the fragment payload is selected from the group

2 consisting of a fragment, a fragment reference, and an attribute.

1 55. The system of claim 50, wherein the update command is selected from the group

2 consisting of add, delete, and replace commands.

1 56. The system of claim 50, wherein the system further comprises a communications

2 interface coupled to the processor through the bus and further coupled to a

3 communications medium; and the encode process further causes the processor to send the

4 fragment update unit as part of an access unit through the communications interface.